

## WHAT IS CLAIMED IS:

1. A method of making a *Lycopersicon esculentum* plant that contains within its genome an allele that encodes for resistance to tomato yellow leaf curl virus in the coupling phase with an allele that encodes for resistance to root-knot nematodes,  
5 wherein a plant containing these alleles is resistant to both tomato yellow leaf curl virus and root-knot nematodes, the method comprising the steps of:

a) identifying an allele in a species of tomato that encodes for resistance to tomato yellow leaf curl virus;

b) comparing a polynucleotide sequence of the allele in step a) with at least one polynucleotide sequence selected from the group consisting of SEQ ID NO.: 10 and SEQ ID NO.: 11 and identifying at least one polymorphism between the polynucleotide sequences;

c) designing a molecular test that can distinguish a polymorphism identified in step b);

d) identifying an allele in a species of tomato that encodes for resistance to root-knot nematodes, wherein said allele is from a different species of tomato than the allele identified in step a) that encodes for resistance to tomato yellow leaf curl virus;

e) comparing a polynucleotide sequence of the allele in step d) with at least one polynucleotide sequence selected from the group consisting of SEQ ID NO.: 7, SEQ ID NO.: 8 and SEQ ID NO.: 9 and identifying at least one polymorphism between the polynucleotide sequences;

f) designing a molecular test that can distinguish polymorphism identified in step e); and

g) introgressing into the genome of a *Lycopersicon esculentum* the allele identified in step a) and the allele identified in step d) in coupling phase using marker-assisted selection, wherein the marker-assisted selection employs the molecular tests designed in steps c) and f).

2. The method of claim 1, wherein at least one polymorphism is a single nucleotide polymorphism.

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3. The method of claim 2, wherein the single nucleotide polymorphism results in a difference in a restriction endonuclease recognition site in the allele identified in step a) when compared to SEQ ID NO.: 10 and/or SEQ ID NO.: 11 and in a restriction endonuclease recognition site in the allele identified in step d) when compared to SEQ ID NO.: 7, SEQ ID NO.: 8 and/or SEQ ID NO.: 9.

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4. The method of claim 1, wherein the allele that encodes for resistance to tomato yellow leaf curl virus is a *Ty-1* allele or any polymorphic variant of the *Ty-1* allele.

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5. The method of claim 1, wherein the allele that encodes for resistance to root-knot nematodes is a *Mi-1* allele or any polymorphic variant of the *Mi-1* allele.

6. A *Lycopersicon esculentum* plant produced by the method of claim 1.

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7. A part of the *Lycopersicon esculentum* plant of claim 6.

8. The part of claim 7, wherein said part is selected from the group consisting of: cells, cell tissue cultures, callus (calli), cell clumps, embryos, leaves, petals, stems, roots, root tips, shoots, protoplasts, somatic embryos, anthers, petioles, ovules, pollen, styles, stamens and seed.

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9. A method of producing a *Lycopersicon esculentum* plant in a tomato breeding program, the method comprising the steps of:

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a) obtaining the *Lycopersicon esculentum* plant or its part of claims 6 or 7 or a descendant of the *Lycopersicon esculentum* plant or part thereof of claims 6 or 7 as a source of breeding material; and

b) employing the *Lycopersicon esculentum* plant or part thereof obtained in step a) as a source of plant breeding material in a plant breeding program using plant breeding techniques to produce a *Lycopersicon esculentum* plant.

5           10.     The method of claim 9 wherein the plant breeding techniques are recurrent selection, backcrossing, pedigree breeding, mutagenesis, transformation or combinations of these techniques or portions of these techniques.

10           11.     A *Lycopersicon esculentum* plant produced by the method of claim 9.

12.     A part of the *Lycopersicon esculentum* plant of claim 11.

13.     The part of claim 12, wherein said part is selected from the group consisting of: cells, cell tissue cultures, callus (calli), cell clumps, embryos, leaves,  
15     petals, stems, roots, root tips, shoots, protoplasts, somatic embryos, anthers, petioles, ovules, pollen, styles, stamens and seed.

14.     A method of making a *Lycopersicon esculentum* plant that contains within its genome at least one tomato yellow leaf curl virus resistance allele designated as *Ty-1*  
20     in the coupling phase with at least one root-knot nematodes resistance allele designated as *Mi-1*, wherein a plant containing the *Ty-1* and *Mi-1* alleles is resistant to both tomato yellow leaf curl virus and root-knot nematodes, the method comprising the steps of:

introgressing into the genome of a *Lycopersicon esculentum* at least one *Ty-1*  
25     allele that encodes for resistance to tomato yellow leaf curl virus and at least one *Mi-1* allele that encodes for resistance to root-knot nematodes in the coupling phase using marker-assisted selection, wherein the marker-assisted selection employs at least one of the following primer pairs:

30           5' TAATCC GTCGTTACCTCTCC TT 3' (SEQ ID NO.: 1) and 5' CGGATGACTTCAATAGCAATGA 3' (SEQ ID NO.: 2);

35           5' AACCGTGGAC TTTGCTTTGA CT 3' (SEQ ID NO.: 3) and 5' TAAGAACAGG GACTCAGAGG ATGA 3' (SEQ ID NO.: 4);

5' CTACGGAGGATGCAAATAGA A 3' (SEQ ID NO.: 5) and 5' AATCATTATT GTCACACTTCCCC 3' (SEQ ID NO.: 6); or

variants of any of SEQ ID NOS. 1-6.

15. The method of claim 14, wherein the *Ty-1* allele is from *Lycopersicon chilense*.

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16. The method of claim 14, wherein the *Mi-1* allele is from *L. peruvianum*.

17. A *Lycopersicon esculentum* plant produced by the method of claim 14.

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18. A part of the *Lycopersicon esculentum* plant of claim 17.

19. The part of claim 20, wherein said part is selected from the group consisting of: cells, cell tissue cultures, callus (calli), cell clumps, embryos, leaves, petals, stems, roots, root tips, shoots, protoplasts, somatic embryos, anthers, petioles, ovules, pollen, styles, stamens and seed.

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20. A method of producing a *Lycopersicon esculentum* plant in a tomato breeding program, the method comprising the steps of:

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a) obtaining the *Lycopersicon esculentum* plant or its part of claims 17 or 18 or a descendant of the *Lycopersicon esculentum* plant or part thereof of claims 17 or 18 as a source of breeding material; and

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b) employing the *Lycopersicon esculentum* plant or part thereof obtained in step a) as a source of plant breeding material in a plant breeding program using plant breeding techniques to produce a *Lycopersicon esculentum* plant.

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21. The method of claim 20 wherein the plant breeding techniques are recurrent selection, backcrossing, pedigree breeding, mutagenesis, transformation or combinations of these techniques or portions of these techniques.

22. A *Lycopersicon esculentum* plant produced by the method of claim 20.

23. A part of the *Lycopersicon esculentum* plant of claim 22.

24. The part of claim 23, wherein said part is selected from the group consisting of: cells, cell tissue cultures, callus (calli), cell clumps, embryos, leaves, petals, stems, roots, root tips, shoots, protoplasts, somatic embryos, anthers, petioles, ovules, pollen, styles, stamens and seed.

25. A *Lycopersicon esculentum* plant that comprises within its genome at least one tomato yellow leaf curl virus resistance allele designated as *Ty-1* in the coupling phase with at least one allele for resistance to root-knot nematodes designated as *Mi-1*.

26. The *Lycopersicon esculentum* plant of claim 25, wherein the *Ty-1* allele is from *Lycopersicon chilense*.

27. The *Lycopersicon esculentum* plant of claim 25, wherein the *Mi-1* allele is from *L. peruvianum*.

28. The *Lycopersicon esculentum* plant of claim 25, wherein the *Ty-1* allele and *Mi-1* allele are in the coupling phase on chromosome 6.

29. A part of the *Lycopersicon esculentum* plant of claim 25.

30. The part of claim 29 wherein said part is selected from the group consisting of: cells, cell tissue cultures, callus (calli), cell clumps, embryos, leaves, petals, stems, roots, root tips, shoots, protoplasts, somatic embryos, anthers, petioles, ovules, pollen, styles, stamens and seed.